ENVIRONMENTAL PROTECTION AGENCY

Corporate Average Fuel Economy

What is Corporate Average Fuel Economy?

Corporate Average Fuel Economy, or CAFE, refers to a program created to determine whether or not vehicle manufacturers' are complying with the gas mileage, or fuel economy, standards set by the federal government.
The CAFE values are obtained by combining the city and highway fuel economy test results and computing an average which is weighted by vehicle sales.

Tests are conducted in a laboratory by operating vehicles on a dynamometer. The Office of Mobile Sources in the Environmental Protection Agency (EPA) administers the testing program which generates the fuel economy data and determines the procedures for calculating the fuel economy values for CAFE. The National Highway Traffic and Safety Administration (NHTSA), part of the Department of Transportation (DOT), is authorized to assess penalities based on the information EPA supplies and to modify the standards.

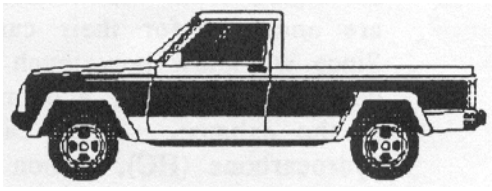
Vehicles are divided into two basic categories: passenger cars and light- duty trucks. This includes all four-wheeled highway vehicles of less than 8500 pounds Gross Vehicle Weight Rating (GVWR). Heavy-duty vehicles (vehicles and trucks over 8,500 pounds gross vehicle weight), motorcycles, and off-road vehicles are not currently subject to CAFE.

What are the **CAFE** standards?

Standards are set annually by NHTSA. 1991 are:

The CAFE standards for model year

Passenger Cars	27.5 **mpg**
Combined Trucks	20.2 **mpg**
2WD Trucks	20.7 **mpg**
4NVD Trucks	19.1 mpg



What penalties do manufacturers face when they do not meet a CAFE standard?

When manufacturers do not comply with a particular year's standard, they are liable for civil penalties of $5.00 per vehicle produced for each tenth (0.1) of a mpg the manufacturer falls below the standard. So, if a manufacturer produces one million cars in a model year and misses the standard by 1.0 mpg, the penalty would be $5.00 multiplied by 10, then multiplied by one million, to equal $50 million.

For model years 1983 through 1989, over 30 penalties were assessed and a total of almost $165 million was collected. Companies which paid penalties during these years were all foreign manufacturers, predominately European luxury car manufacturers.

How are the gas mileage estimates for CAFE obtained?

The gas mileage estimates are based on the results of tests required on new motor vehicles (cars and light trucks). Test vehicles are driven by a trained driver on a dynamometer, an instrument that simulates on-road driving in a laboratory. The same tests are performed on each vehicle tested, following approved procedures, as described in the Code of Federal Regulations (CFR). These procedures ensure that each vehicle is tested under identical conditions.

All results of tests run for the fuel economy labeling program and for emission certification are used, plus results from any additional vehicles tested to achieve the minimum data required for the CAFE calculation. All testing is done by the manufacturer with about 3,000 tests done annually. EPA audits the manufacturers' data and confirms these results by testing about one-third of the vehicles at the Motor Vehicle Emission Laboratory in Ann Arbor, Michigan.

Two types of tests are run, one to represent urban driving (city test) and one to represent non-urban driving (highway test). Combined fuel economy is the weighted average of these two tests, with the city test making up 55 percent of the average and the highway 45 percent.

The *city* test simulates a 7.5 mile, stop-and-go trip on city streets with an average speed of about 20 mph. The *highway* test represents a mixture of 11 non-city" driving. Segments corresponding to different kinds of rural roads and interstate highways are included. The test simulates a 10 mile trip and averages 48 mph.

How is CAFE calculated from these tests?

EPA does not actually measure the fuel consumed. A fuel economy value is calculated from the emissions generated during the tests. The emissions are analyzed for their carbon content using a carbon balance equation. Since we know how much carbon is in a typical gallon of test fuel, we can determine the fuel economy by measuring the carbon compounds expelled in the exhaust. Three carbon compounds are expelled and measured-, hydrocarbons (HC), carbon monoxide (CO), and carbon dioxide (CO2).

The combined fuel economy for the vehicle is then determined. Once the fuel economy for each vehicle tested is determined, then these values are sales-weighted and the average of the ratios is determined for each tested configuration (a subgroup of similar vehicles).

All the values from different configurations must be combined into a single value for each base level (a larger subgroup of similar configurations). Then all the values from different base levels must be combined into a single value for each model type. Model type values for each manufacturer are then combined into the Corporate Average Fuel Economy value.

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